



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
|-----------------|-------------|----------------------|---------------------|------------------|

10/597,730

03/14/2007

Christian Vauge

5867

5455

26936 7590 09/13/2010  
SHOEMAKER AND MATTARE, LTD  
10 POST OFFICE ROAD - SUITE 100  
SILVER SPRING, MD 20910

EXAMINER

BERMAN, JASON

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

09/13/2010

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|                              |                                      |   |  |
|------------------------------|--------------------------------------|---|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/597,730 | <b>Applicant(s)</b><br>VAUGE, CHRISTIAN |  |
|                              | <b>Examiner</b><br>Jason M. Berman   | <b>Art Unit</b><br>1795                 |  |

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 31-59 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 31-59 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. ____.                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>8/4/06</u> .  | 6) <input type="checkbox"/> Other: ____.                          |

## **DETAILED ACTION**

### ***Status of the Claims***

Claims 31-59 are pending in the current application.

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 44-45 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131

Art Unit: 1795

USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949).

In the present instance, claim 44 recites the broad recitation 'electrically coupled to', and the claim also recites 'formed in one piece' which is the narrower statement of the limitation.

Claim 45 recites the broad recitation 'hollow body,' and the claim also recites 'hollow cylinder' which is the narrower statement of the limitation.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 31, 33-39, 41-46 and 48-58 are rejected under 35 U.S.C. 102(b) as being anticipated by Goudy (US 2002/0170817).

As to claim 31, Goudy discloses a plasma generating device comprising:

- At least one first plasma-generating section, wherein a first plasma is generated (figure 10: plasma generation generating region 105);
- At least one second plasma-generating section, wherein at least one second plasma is generated (figure 10: plasma generation region 106);

Art Unit: 1795

- Wherein at a given point of time, first and second plasmas are of different polarity (paragraph 200: operating of power supplies in opposing polarities to allow for coronas to be out of phase).

As to claim 33, Goudy discloses the device comprises a chamber allowing for contacting a gaseous medium with the first and second plasmas (paragraph 200; figure 10: gas flow path 115).

As to claim 34, Goudy discloses the plasmas are corona discharge plasma (abstract: corona discharge).

As to claim 35, Goudy discloses the first and second plasma-generating sections are supplied by an AC current (paragraph 92: use of AC power for power supply).

As to claim 36, Goudy discloses the first and second plasma generating sections are supplied with AC current of opposite phase (paragraph 200: first and second region electrically out of phase).

As to claim 37, Goudy discloses the first and second plasma generating sections are supplied with AC current of the same amplitude (paragraph 92: use of AC power; paragraph 200: use of same power supply, with different polarity [positive and negative] to each electrode).

As to claim 38, Goudy discloses the frequency of the current is in the range of DC to about 500 kHz of AC (paragraphs 148 and 151: frequencies of power supply).

As to claim 39, Goudy discloses the first and second plasma generating sections are supplied with DC current (paragraph 92: use of DC power).

Art Unit: 1795

As to claim 41, Goudy discloses the first and second plasma generating sections are integrated in a flow-through housing with an inlet and outlet for a gaseous medium (figure 10: showing one embodiment of system 100 with housing 101 and gas flow 115).

As to claim 42, Goudy discloses the gas is divided into separate streams within the housing and the streams are each contacted with at least one of the first or second plasmas (figure 40: showing air flow split above and below electrode supports).

As to claim 43, Goudy discloses the first and second plasma generating sections are arranged alternatingly between inlet and outlet (figure 10: showing plasma generating electrodes 102 between inlet and outlet).

As to claim 44, Goudy discloses the electrode of the first plasma section is electrically coupled to an electrode of the second plasma section (paragraph 200: the input electrodes may be connected to the same power supply in parallel).

As to claim 45, Goudy discloses the electrode of the first plasma generating section is coupled to the electrode of the second section (paragraph 200) and is formed of a hollow body having a plurality of tip on one end of the hollow body (figures 44 and 45: showing cylindrical electrode coil and counter-electrode).

As to claim 46, Goudy discloses a method of treating a gaseous medium with a plasma comprising:

- Generating a first plasma (figure 10: plasma generation generating region 105);
- Generating a second plasma (figure 10: plasma generation region 106);

Art Unit: 1795

- The first and second plasmas are of different polarity (paragraph 200: operating of power supplies in opposing polarities to allow for coronas to be out of phase);
- Contacting the gaseous medium with the first and second polarities (figure 10: gas flow 115).

As to claim 48, Goudy discloses generating a first and second plasma (abstract; figure 10) with the plasmas being of different polarity (paragraph 200).

As to claim 49, Goudy discloses the plasmas are corona discharge plasma (abstract: corona discharge).

As to claim 50, Goudy discloses the first and second plasma-generating sections are supplied by an AC current (paragraph 92: use of AC power for power supply).

As to claim 51, Goudy discloses the first and second plasma generating sections are supplied with AC current of opposite phase (paragraph 200: first and second region electrically out of phase).

As to claim 52, Goudy discloses the first and second plasma generating sections are supplied with AC current of the same amplitude (paragraph 92: use of AC power; paragraph 200: use of same power supply, with different polarity [positive and negative] to each electrode).

As to claim 53, Goudy discloses the frequency of the current is in the range of DC to about 500 kHz of AC (paragraphs 148 and 151: frequencies of power supply).

As to claim 54, Goudy discloses the first and second plasma generating sections are supplied with DC current (paragraph 92: use of DC power).

As to claim 55, Goudy discloses the first and second plasma generating sections are integrated in a flow-through housing with an inlet and outlet for a gaseous medium (figure 10: showing one embodiment of system 100 with housing 101 and gas flow 115).

As to claim 56, Goudy discloses the gas is divided into separate streams within the housing and the streams are each contacted with at least one of the first or second plasmas (figure 40: showing air flow split above and below electrode supports).

As to claim 57, Goudy discloses the gas is contacted between the inlet and outlet of the flow-through housing with the first and second plasma (figure 10: showing plasma generating electrodes 102 between inlet and outlet).

As to claim 58, Goudy discloses a method of sterilizing a gaseous medium with a plasma comprising:

- Generating a first plasma (figure 10: plasma generation generating region 105);
- Generating a second plasma (figure 10: plasma generation region 106);
- The first and second plasmas are of different polarity (paragraph 200: operating of power supplies in opposing polarities to allow for coronas to be out of phase);
- Contacting the gaseous medium with the first and second polarities (figure 10: gas flow 115).



***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Goudy in view of Shiloh (US 6,245,299).

As to claim 32, Goudy discloses a plasma generating device comprising:

- A first plasma generating section, generated between electrodes (figure 10: plasma generation generating region 105);
- AC power supply connected to the electrodes to generate plasma of different polarities (paragraph 200; figures 44 and 45);

Goudy discloses the conveyance of the gas by a pump and exposing the gas to plasmas of different polarities while controlling the frequency of the power supply (paragraph 156: control of power supply; paragraph 113: use of a pump; paragraph 200:

Art Unit: 1795

use of multiple plasmas at alternating polarities) but is silent as to simultaneous control of the conveyance velocity and power supply frequency.

Shiloh discloses a method of conveying a gas through multiple plasma generation zones (abstract; col 1 lines 7-9; figure 1). Shiloh also discloses it is well known in the art to control the flow rate and power supply frequencies in order to obtain the desired composition within the treated gas stream (col 6 lines 54-62).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to control the power frequencies and gas velocity, as disclosed by Shiloh, in the method of Goudy, because this allows for control over the processing results (Shiloh at col 6 lines 54-62).

8. Claim 40 rejected under 35 U.S.C. 103(a) as being unpatentable over Goudy.

As to claim 40, Goudy discloses the use of a small gap of a suitable size in the range of a 1/16 of an inch and a voltage between 2.5 and 10 kV, but does not explicitly disclose the field is in the range of 30kV/cm (paragraph 149). One of ordinary skill in the art would recognize that the adjustment of result effective variables, such as that of power to an electrode and electrode spacing, may be set as desired. Goudy discloses that one of ordinary skill would recognize that adjustment of these variables is necessary to obtain the desired corona discharge between electrodes (paragraph 89: sufficient voltage and suitable gap necessary for obtaining corona discharge).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the

Art Unit: 1795

invention to use an electric field suitable for plasma formation by corona discharge, as disclosed by Goudy, including a field in the range of 30 kV/cm.

9. Claims 47 and 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goudy, as applied to claim 46 above, and further in view of Shiloh.

As to claims 47 and 59, Goudy discloses the conveyance of the gas by a pump and exposing the gas to plasmas of different polarities while controlling the frequency of the power supply (paragraph 156: control of power supply; paragraph 113: use of a pump; paragraph 200: use of multiple plasmas at alternating polarities) but is silent as to control of the conveyance velocity).

Shiloh discloses a method of conveying a gas through multiple plasma generation zones (abstract; col 1 lines 7-9; figure 1). Shiloh also discloses it is well known in the art to control the flow rate and power supply frequencies in order to obtain the desired composition within the treated gas stream (col 6 lines 54-62).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to control the power frequencies and gas velocity, as disclosed by Shiloh, in the method of Goudy, because this allows for control over the processing results (Shiloh at col 6 lines 54-62).

### ***Correspondence Information***

Art Unit: 1795

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M. Berman whose telephone number is (571)270-5265. The examiner can normally be reached on M-R 8am-5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571)272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nam X Nguyen/  
Supervisory Patent Examiner, Art Unit 1753

/J. M. B./  
Examiner, Art Unit 1795  
9/11/2010